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FARM BUSINESS IN CENTRAL ALBERTA 1943-1944

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Foreword

This survey of the farm business in central Alberta was begun in June, 1944, as part of a larger enquiry into the economic and social problems associated with the utilization of the land in the Prairie Provinces which was initiated in 1935 with the passing of the Prairie Farm Rehabilitation Act. The western boundary of the region, defined as the drouth area for the operation of the Act, cuts through central Alberta. Two-thirds of the area included in this study lies within the defined drouth area and the other third outside. The purpose of this study was to appraise the conditioning factors for earning income in three contrasting districts within and outside the defined drouth area; to investigate problems associated with these factors with a view to making known to all farmers the experiences which have proved most successful in their solution; and to add to the knowledge of those who are responsible for promoting and administering agricultural policy.

The organized field survey was conducted during the summer months of 1944. B. H. Kristjanson was in charge and was assisted by J. L. Anderson, J. Garvin, J. R. S. Jorgens, Leslie Drayston, H. B. Van Horne and Miss Echo Lidster, all on the staff of the Dominion Economics Division at the University of Alberta.

Acknowledgment is also made of the assistance of Professor Andrew Stewart, Department of Political Economy, University of Alberta, who was frequently consulted in the conduct of the field and office study, and in the preparation of this report.

Splendid co-operation was received from the many farmers and local officials interviewed.

The co-operating agencies are indebted to all who have aided in and contributed to the study.

Summary

The business for the year ended April 30, 1944, of 318 farms in three districts in central Alberta was studied. One district (Innisfail) is located in the black soil zone, and the other two (Drumheller and Gadsby) are in the dark brown soil zone.

In the Innisfail district, three-fifths of the farms were of the livestock type. In the Drumheller district more than three-fifths of the farms were of the grain type. In the Gadsby district about three-fifths were of the mixed grain-livestock type, one-fifth of the livestock type, and about one-fifth of the grain type. Soil and climate were the chief determinants of these types.

In size, farms averaged 348 acres in Innisfail with 64 per cent improved; 685 acres in Drumheller with 76 per cent improved; and 586 acres in Gadsby district with 56 per cent improved.

Average values of real estate per improved acre in 1944 approximated $41 in Innisfail; $36 in Drumheller; and $19 in Gadsby district.

The average value of the capital of the 318 farms was over $18,000, made up of $11,000 in real estate, $3,000 in machinery and equipment, $2,300 in livestock, and the balance in seed, feed and other farm supplies. Grain farms carried the highest average investment, nearly $24,000.

The livestock type of farming in the Innisfail district, mainly hogs and dairying, might be described as a semi-intensive one, in contrast to that of the Gadsby district where the more extensive type of enterprise, beef cattle, was more common. Hogs were the main class of livestock on the Drumheller mixed type farms, and during the year of the survey were common to the grain farms as well.

Wheat occupied the largest acreage on the grain farms, and oats on the mixed and livestock types.

Averaged for all types, gross receipts from livestock and livestock products were about the same as from direct sales of grain. Labour earnings were nearly $1,100 per farm.

During the year of the survey, crop yields were only two-thirds normal in the Innisfail district, approximately normal in Drumheller, and considerably above normal in the Gadsby district. As a result the surplus earning above operating, capital maintenance and family cash living expenses averaged less for Innisfail district farms than for farms in the other two districts. Only for the livestock type of farms was the average surplus of the Innisfail district farms greater than that of the Gadsby farms. The Drumheller grain farms had the largest surplus.

The terms 'surplus'—the amount of gross revenue from the whole farm unit above current operating, capital maintenance and operator's family cash living—was used as a measure of profits in determining factors affecting these.

(1) There was a direct correlation between size of business and surplus,

(2) There was a direct correlation between yield and surplus,

(3) Within districts, highest surpluses were associated with the type of agriculture seemingly best adapted to the district; livestock type in Innisfail, grain type in Drumheller, and mixed grain—livestock type in Gadsby.

The biggest crop hazard in Innisfail has been frost, in Drumheller hail, and Gadsby drouth. Weeds have been a menace in all areas, the control of which has been more costly in the Innisfail district. Lack of feed reserves has been one of the hazards in animal production.

In the beginning of the farm business year studied, 1943-44, hog numbers were high on all farm types because the normal marketing channels for grain were dammed up (shipping difficulties during early part of war) and grain was cheap relative to hogs. By the end of the year, the grain marketing channels were reopened, grain prices rose substantially in relationship to hog prices and hog numbers declined on most farms, particularly at Drumheller. In the Innisfail district another contributor factor to the decline in hog numbers was the poor grain crop.

With the same farm organization—acres, cropping plan, number of livestock, capital investment, labour force, etc.—as operated in 1943-44, based on long-time average yields, prices and costs, one could expect as large surplus earnings on a half-section farm in the Innisfail district as a section farm in Gadsby. On average-sized farms for the respective districts, surplus earnings on the Drumheller farms can be expected to range highest.

FARM BUSINESS IN CENTRAL ALBERTA

C. C. Spence[1]

GENERAL CHARACTERISTICS OF THE AREA

The Area and Its Farms

In Alberta there are over 40,000,000 acres of land occupied by farms, and this covers an estimated expanse of 100,000 of the 255,000 square miles of territory within the province. Yet the main characteristics of these farms, excepting the specialized crop farms of the irrigation districts, may be observed within an area scarcely more than 100 miles across, and close to the geographical centre of the agriculturally-settled portion of the province. This area is triangular-shaped, with the towns of Innisfail, Drumheller and Gadsby located at each angle.

Surveys of the Area

An economic survey of this area was made in the summer of 1944. In this survey the business and management of farms were studied in considerable detail. The sampling included 123 farms in the Big Valley-Byemoor-Gadsby district, 95 farms in the Munson-Morrin district north of Drumheller, and 103 farms in the Innisfail-Penhold district (Figure 1). A soil survey of the same region was made in 1943 and 1944.[2]

Climate

Climatically the area is suited to the production of all field crops grown in the province under dry-land conditions. Likewise, every kind of commercial livestock found in the province is produced here. The frost-free period varies from 100 to 120 days, which is about midway between the shorter frost-free period of the more northerly settled areas of the province and the longer frost-free period farther south. However, nowhere in the presently-farmed areas is the frost-free period more than 20 days above or below that of this area.

The annual precipitation at Innisfail-Penhold, on the western side of the triangular area studied, at 17 inches, is about 2 inches above that at the eastern side of the triangle; but for crop production the effectiveness of the precipitation is much greater on the western side than the 2-inch spread indicates, due to a considerably higher rate of evaporation on the open prairie farther east.

Soil and Other Physical Features

The triangle is cut by the zonal line between the black parkland soil and the dark brown prairie soils. The Innisfail district is located in the black soil zone; the other two districts are in the dark brown soil zone. However, the eastern part of the Gadsby district lies close to the light brown soil region, and has many of the characteristics of that region. The texture of the soil varies. That of the Innisfail district is generally a loam, but silty-to-clay loam patches occur, as also do areas of fine sandy loams. Most of the Gadsby district is a loam-textured soil, but in many parts it is shallow. The shallow layers of top

[1] Senior Economist, Dominion Department of Agriculture, University of Alberta, Edmonton.

[2] Soil Survey of Red Deer Sheet, Experimental Farms Service, Dominion Department of Agriculture in co-operation with Department of Soils, University of Alberta (Unpublished).

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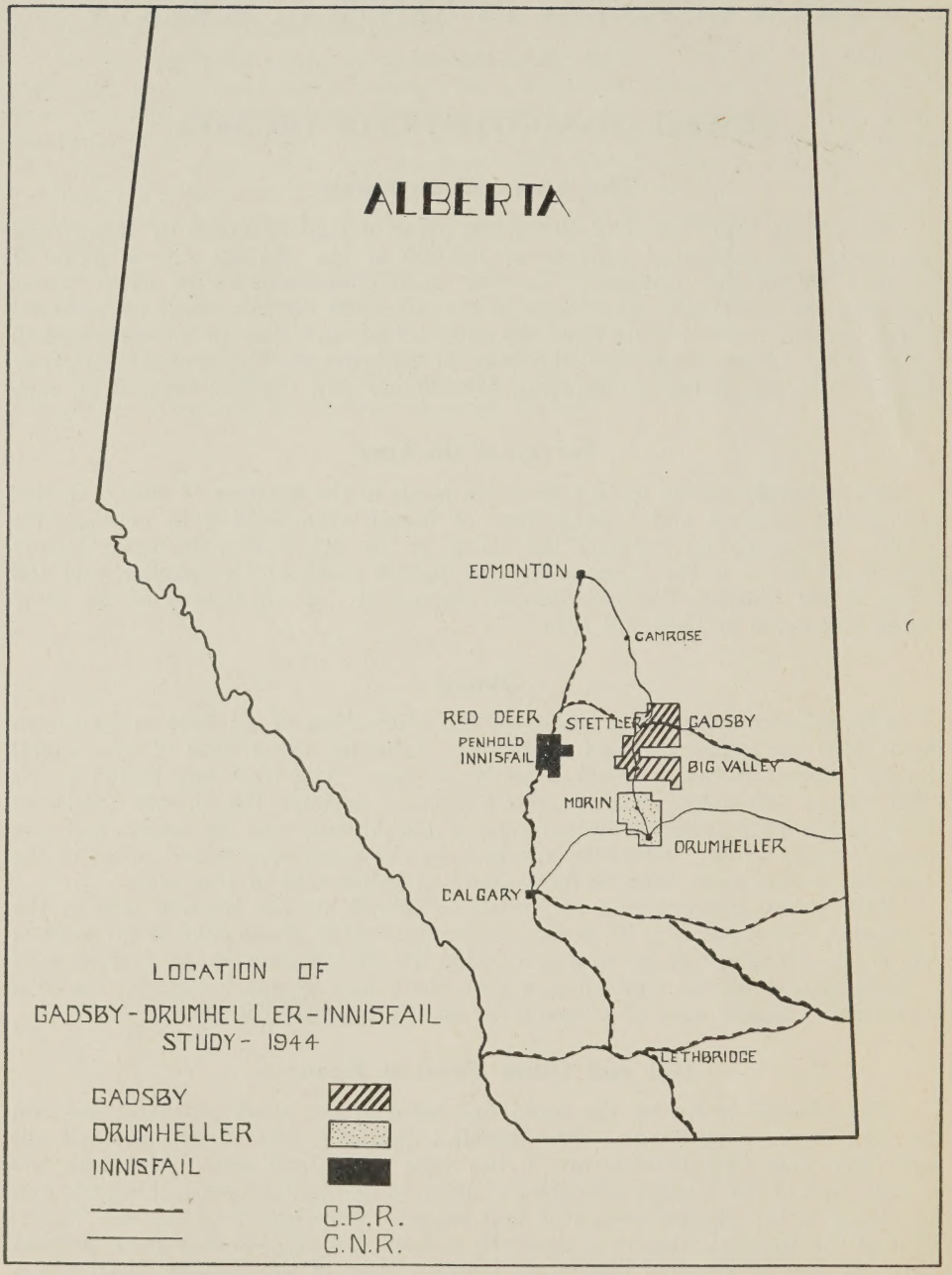

ALBERTA
EDMONTON
CAMROSE
RED DEER
STETTLER
GADSBY
PENHOLD
INNISFAIL
BIG VALLEY
MORIN
DRUMHELLER
CALGARY
LETHBRIDGE
LOCATION OF
GADSBY - DRUMHELLER - INNISFAIL
STUDY - 1944
GADSBY
DRUMHELLER
INNISFAIL
C.P.R.
C.N.R.

FIG. 1

soil over much of the district are underlain with a tough semi-impervious layer (solonetz) formation which makes the land less productive than where the soil is deeper. The soil of the Drumheller district is a deep heavy clay, which on the prairies of Saskatchewan and Alberta has proved to be one of the best wheat soils. As a wheat soil, its strength in an area of comparatively light rainfall is due in a large measure to its water-holding capacity. The origin of this superior wheat soil is lacustrine. The topography is usually level to gently rolling and free from stones. It is ideal for the operation of large-scale machinery.

In general, the topography of all three farming districts is level to gently rolling. Between the Innisfail district and the other two, there runs from north to south a moraine belt eight to fifteen miles wide, the greater part of which is hilly. The Red Deer River, which runs in a general southeast direction, parallels this moraine belt for some distance and then cuts it. Along the banks of this river and running for some distance back there are numerous stretches of sandy loam soil. Thus a considerable part of the land separating the Innisfail district on the west from the Gadsby and Drumheller districts on the east is not suitable for cultivation and is best used for grazing. Cattle grazing predominates there.

Climatic and Physical Characteristics, and Farm Types

As noted, there are some climatic differences among the three districts. Likewise there are some differences in soil characteristics among the three districts, and to a lesser extent differences in topography. As a result of these differences in climate and land characteristics, a different type of farming predominates in each of the three districts. In 1944 in the Innisfail district, three-fifths of the farms were of the livestock type and very few were of the grain type; in the Drumheller district, more than three-fifths were of the grain type and virtually none were of the livestock type; and in the Gadsby district about three-fifths were of a mixed grain and livestock type, one-fifth were of the livestock type, and about one-fifth were of the grain type (Table 1).

TABLE 1.—DISTRIBUTION OF FARMS BY DISTRICT AND TYPE
GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Type	District		
	Gadsby	Drumheller	Innisfail
	no.	no.	no.
Grain	26	68	6
Livestock	24	1	58
Mixed grain-livestock	70	26	39
All types	120	95	103

Generally speaking, livestock types of farming are most common in the western part of the province from north to south, on the black and grey wooded soil zones; mixed grain-livestock types are most common in the eastern part on the brown soils and across the northeastern part of the province in the black and grey wooded soil zones; and the grain farms are most common on the dark brown soil zones in the central part extending in a southwest direction to the International Boundary. However, within these broad regions there are areas where the type of farming differs greatly from that generally described for the region, and the factors most important in determining these are the characteristics of the land—chiefly soil and topography. Livestock ranches are scattered across the south on both the brown and black soils.

In a rough classification of the farms of Alberta by these three descriptions in 1944, there were approximately 38 per cent of the livestock type, 34 per cent of the grain type, and 26 per cent of the mixed type.[1]

Settlement of Central Alberta

Of the three districts of the region, that to be settled first was Innisfail-Penhold. It was adjacent to the Calgary and Edmonton railway line, which was built in 1891 after the transcontinental line had been built into Calgary.

Although there were trees in the Innisfail-Penhold district, there was also a considerable amount of open land covered with tall grass. Here the trees had been destroyed by fire, and the land was fairly easy to break for cropping. Water was easily obtained in this part, and this, together with a plentiful supply of wood, encouraged the first settlers to settle there and others to follow. The land was, and still is, very fertile. Crops grew ranks, and with the comparatively late-maturing grain varieties which were grown in those days, frost was a severe hazard. A number of the earlier settlers, from Kansas and Missouri, became discouraged and returned to the United States.

At the turn of the century it was discovered that grain could be ripened much more readily farther east. This was also an open plains country, easily ploughed and with abundant grass. The country to the southeast of Innisfail, toward Drumheller, was less attractive to the prospective settler in those days than was that to the northeast. It, too, was open prairie, but with shorter grass and little evidence of water over wide stretches. In contrast, the land to the northeast was dotted with small lakes and streams.

During the first decade of the present century, settlement pushed north and east toward the Stettler-Gadsby country, and with the building of the railway east of Lacombe in 1905, the country filled rapidly. A number of these earlier settlers came into this district from the same States as did those who earlier tried and failed in the Innisfail-Penhold country. It was not only the lesser frost hazard that encouraged settlers to go east rather than west, but also the ease of preparing the land for cropping, and the more nutritious and thickly-matted grass cover. The country a few miles west of the Calgary and Edmonton line was a wooded one and trees had to be cleared before the land could be broken. A goodly number of people returned to this tree country three decades later following the severe and prolonged drought of the early thirties, which forced them to abandon their prairie farms far to the east within the light brown soil zone and seek a livelihood in the surer crop districts to the west.

The Drumheller district was settled after the Gadsby district. The railway was built through the area in 1910. Much of the land in the Drumheller district was not occupied for farming until that year. The productiveness of the land was soon recognized, and during the second decade much land was brought into cultivation. In 1944, over 76 per cent of the land on the Drumheller plain was in cultivation. In the Gadsby district, by 1944, only 56 per cent was in cultivation, due chiefly to the fact that the soil had been recognized as being of a comparatively inferior grade for cropping.

Although the Innisfail-Penhold district has been settled much longer than the Drumheller plains, only 64 per cent of it is improved for cultivation. The land in this district is more costly to bring under cultivation. With settlement, there came more control over prairie and bush fires. The settlers were aided in this by a series of comparatively wet years, from the middle nineties on. Trees and shrubs grew on the virgin parkland soil, and the necessity of removing these added to the labour required to bring the land under cultivation.

[1] Farm Survey, Alberta Post-War Reconstruction Committee.

The People

The three districts were settled by the same racial stocks—British, Scandinavian and German—with by far the greater number being of British descent. Except for the advent of a few other nationalities, the complexion of the racial origin of the farm population in the area has changed little. More than two-thirds of the farm population in the area are of British stock, and the proportion is about the same in each of the three districts. Almost two-thirds of the farmers were born in Canada or in the United States.

Although the settlement in the Innisfail district is somewhat older than that in the other two districts, the present occupants of the land have not resided on their farms as long as have those in the Gadsby and Drumheller districts. It was found that there were more second generation farmers in the Innisfail district. In 1944, the occupants of the Innisfail district had been on their farms 17 years on an average; those of the Gadsby district had been on their farms 30 years; and those of the Drumheller district 22 years. Less than 4 per cent of the farmers in the Innisfail district were occupying land which they had homesteaded. The earliest of these settlers occupied his present holding in 1892. Nearly 20 per cent of those interviewed in the Gadsby district were occupying their homesteads, the earliest date of occupancy being 1903, and nearly 30 per cent of the Drumheller farmers interviewed were occupying their original homesteads, the earliest being occupied in 1906.

Development of the Area

Density of settlements.—At the beginning of the present century, there were about 180 persons per township in the Innisfail district. In the Gadsby and Drumheller districts, it was almost ten years later before the population reached 100 persons per township. The number of people per township in the Innisfail district has always far exceeded that in the other two districts. In 1936, at nearly 300 persons per township, the population of the Innisfail district was 50 per cent more than that of Drumheller, and 75 per cent more than that of Gadsby. These figures represent rural population only.

Comparative densities of settlement may also be noted in size of farm holdings. In the Innisfail district the average size of farm was approximately 348 acres; in the Drumheller district it was 685; and in the Gadsby district it was 586 acres. Thus, in total acreage, the Innisfail farms were only about one-half the size of those in the Drumheller district; in cultivated acreage, they were considerably less than one-half.

Farm buildings.—During the survey, the farm buildings were rated according to size and condition. Three size ratings were used: 'large', 'medium' and 'small', and the terms applied to the extent of the investment as well as to the physical dimensions of the buildings. The terms used to describe the condition were 'good', 'fair' and 'poor'. In the Drumheller district, nearly 40 per cent of the farm houses were rated in the large category, and nearly 50 per cent were considered in good condition. In the Innisfail district, about the same proportion of farm houses as in the Drumheller district were rated large. However, only 22 per cent were considered in good condition. Houses in the Gadsby district were somewhat smaller and poorer than in the other two areas.

Although a larger proportion of the Drumheller and Innisfail barns were in the large category than those of Gadsby, only a slightly higher proportion of the barns were in fair and good condition.

The condition of barns does reflect in some degree the prosperity and stability of the agriculture of a region, but size need not be so directly associated, especially in regions where both grain and livestock types of farming are carried on. With increased mechanization of farms, size of barns has less significance now than formerly.

Prosperity of an Area Judged by the Financial Situation of Its Farmers

It is difficult to give a statistical presentation of what has been accomplished in a district since its first settlement, and more difficult still to compare the accomplishments within one district with those of another. In the first place, only the experience of those who have remained can be studied, and within a relatively poor district only those who have been more successful remain; whereas, in the better districts there has been less elimination. In the second place, there is no means of measuring how much capital has been taken out of a district by those who have gone away. In farming, it is customary for each successive generation on leaving the farm to take a good part of the money value of their property with them, and leave to the succeeding generation the task of raising a substantial sum of money to pay them off. Thus, each generation begins anew the task of paying for the land and its improvements and must delay additional improvements until the more pressing obligations assumed on taking over the farm have been met. Nevertheless, something concerning the prosperity of a district can be learned from the financial statements of its present occupants. There is some shifting in and out of every district all the time, and this makes for a degree of comparability between districts as to the occupancy period of its residents. Although, as noted, the term of occupancy of the farmers co-operating in the study in the Innisfail district is a few years less than that of those of the other two districts, a greater proportion of the Innisfail farmers were sons of the earlier settlers, and it is reasonable to assume that their inheritance may have been at least equivalent to the additional accumulation of the farmers in the other two districts made possible by the few years longer occupancy.

Net worth of farmers in three districts.—The financial statements of the co-operating farmers show that during the period of occupancy, the average gain in net worth was approximately as follows: in the Gadsby district, $8,000; in the Drumheller district, $23,500; and in the Innisfail district, $9,300. The average net worth of these farmers when they commenced operating their present farms varied from about $2,400 for those in Gadsby to $3,000 for those in Drumheller. The average net worth according to tenure is given in Table 2.

TABLE 2.—NET WORTH BY DISTRICT AND TENURE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Tenure	District					
	Gadsby		Drumheller		Innisfail	
	no.	$	no.	$	no.	$
Owners	51	9,391	51	29,889	59	11,872
Owner-renters	48	13,492	33	27,107	30	17,727
Renters	21	5,708	11	8,677	14	5,543
All tenures	120	10,387	95	26,466	103	12,717

Assets and liabilities.—The farm real estate constituted nearly two-thirds of the total assets of the farmers in Innisfail and Drumheller, but only slightly more than one-half in the Gadsby district. Livestock comprised more than one-fifth of the total assets in Gadsby and Innisfail, but only 5 per cent in the Drumheller district. Farm machinery varied from 16 per cent to 19 per cent

of the total assets of the operators in all three districts. The other assets were in the form of feed and supplies on hand, household furniture, and savings of various kinds in stocks, bonds, insurance and cash.

Liabilities were relatively small in all three districts. Debts associated with real estate comprised 79 per cent of total liabilities, but fewer than one-half the farms had any land debt. Tax arrears accounted for 9 per cent of the farmers' liabilities, two-thirds of the tax indebtedness being in the Gadsby-Byemoor district. The average liabilities according to tenure are given in Table 3.

TABLE 3.—AVERAGE DEBT BY DISTRICT AND TENURE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Tenure	District					
	Gadsby		Drumheller		Innisfail	
	no.	$	no.	$	no.	$
Owners	51	1,526	51	2,085	59	1,644
Owner-renters	48	1,523	33	1,547	30	1,592
Renters	21	154	11	394	14	229
All tenures	120	1,285	95	1,702	103	1,436

On the whole, it is felt that the values given to the assets were conservative. Except in the case of livestock, the long-run average rather than current prices was the guide in establishing valuations. Current market prices were the basis for estimating the values of livestock. As noted, the asset which constituted the greatest proportion of the total assets was real estate. The average value of real estate per acre was $10 in Gadsby, $28 in Drumheller, and $26 in Innisfail. The approximate value per acre on an improved or cultivated basis was $19 in Gadsby, $36 for Drumheller, and $41 for Innisfail. As used here, the term 'real estate' includes the buildings as well as the land.

Levels of Living of the People

The gain in net worth over a period of years is only one measure of success in farming. The level of living sustained by the farm business is equally, if not more, important. Although far from being a complete measure in itself, the total of cash and non-cash costs of the farm family living is an indication of the level of living enjoyed by the family for the particular time covered in the cash statement. To the extent also that living costs are based on obligations assumed previously, current living costs reflect the level of living enjoyed in the period which immediately preceded.

During the year 1943-44, the average cash living costs of the Gadsby, Drumheller and Innisfail farm families included in the study were $962, $1,226 and $996, respectively. The non-cash costs, consisting of use of the farm house and fuel and food produced and consumed on the farm, averaged $457, $521 and $484, making the average total farm family living costs, cash and non-cash, $1,419, $1,747 and $1,480, respectively.

These living costs indicate quite a high plane of farm living. For the Gadsby district they were, probably, a little above normal. In this district, the 1943 crop was better than average, and with rising prices, farm income was up. This, no doubt, resulted in the living expenses being above those of previous years.

FARM ORGANIZATION AND BUSINESS

Land Utilization

In discussing the farm businesses of central Alberta, it would appear to be a better plan to describe each of the three main types separately than to attempt to deal in averages of all types combined. The three main types of farming have already been referred to as grain, livestock and mixed; and the distribution of the farms in the three representative districts of the region according to these types has also been given (Table 1).

The utilization of the land on these farms according to type for the Gadsby-Drumheller-Innisfail area as a whole is summed up in Table 4. The average cultivated acreage per farm was greatest on the grain type farms. It varied from an average of 307 acres on grain farms in Innisfail to 548 acres on grain farms of the Drumheller district.

TABLE 4.—UTILIZATION OF LAND BY TYPE OF FARM—GADSBY-DRUMHELLER-INNISFAIL, 1943-1944

Type	No. of Farms	Average area of Farm	Average in Crop-land	Percentage of Cropland						
				Wheat	Oats	Barley	Flax	Mixed Hay	Im-proved Pasture	Fallow
	acres	acres	acres	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Grain	100	688	514	27	12	8	5	2	2	44
Livestock	83	379	201	12	25	20	.....	10	6	27
Mixed	135	526	323	18	20	12	2	6	4	38

Productive Livestock

The survey indicates that there are very few farms in central Alberta on which no livestock is kept. Any such farms are of the grain type. There were cattle on more than two-thirds of the grain farms covered in the survey and hogs on more than one-third. On almost every livestock and mixed farm, both these kinds of livestock were found. There were sheep on less than 8 per cent of the farms. All farms had chickens and more than one-third had turkeys. The number of farms according to kind of livestock kept is given in Table 5.

For those farms with milk cows (all farm types) the average number was about 6 head (Table 6). The number kept varied from 1 to 30. During the year (1943-44) the number of milk cows kept on farms increased as did the

TABLE 5.—NUMBER OF FARMS HAVING LIVESTOCK, BY DISTRICT—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Kind of Livestock	District		
	Gadsby	Drumheller	Innisfail
	no.	no.	no.
Cows—milk	102	75	93
Cows—beef	61	29	36
Other cattle	116	84	98
Sheep	4	3	17
Hogs	106	72	97
Chickens	120	95	103
Number of farms	120	95	103

TABLE 6.—AVERAGE NUMBERS OF LIVESTOCK PER FARM, BY DISTRICT—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Kind of Livestock	District		
	Gadsby	Drumheller	Innisfail
	no.	no.	no.
Cows—milk	6	3	7
Cows—beef	20	9	9
Other cattle	15	8	16
Sheep	94	115	65
Hogs	16	19	41
Chickens	75	69	128
Number of farms	120	95	103

numbers of other livestock. The number of beef cows on farms also increased during the year. On farms with this class of livestock, the number averaged about 15 head at the end of the business year, which was three head more than in the beginning. This does not include the young stock, of which there was a corresponding increase. There were approximately 6 steers and 2 heifers sold per farm during the year.

In all three districts, for all types, there were fewer sows per farm at the close of the business year, 1943-44, than at the beginning. However, at the end there were more other hogs on the livestock and mixed types of farms than in the beginning. The average number of sows for the livestock and mixed farms was about 5, and for the grain farms 3, where this class of hogs was kept. For all farms there was an average of 38 hogs sold during the year, the greatest number sold from any one farm being 282. Incidentally, this was a grain farm.

The average number of chickens kept on the farms throughout the year was 100. During the year the number per farm increased from an average of 84 to 124. There was also a big increase in the number of turkeys kept.

Horses a Source of Power

In 1944, horses were still an important source of field power on central Alberta farms. Of the 318 farms, 28 per cent were tractor-operated only; there was at least one 4-horse team as well as a tractor on 48 per cent of the farms; and on 24 per cent of the farms horses alone were used as power. On one-fourth of the grain farms there were no horses, but on the other types there were very few farms which had none. The average number of horses on farms using horses was 7. During the year there was a decrease of about 5 per cent in the number of horses. An average of one horse to every $3\frac{1}{2}$ farms was sold during the year. The average selling price per horse was $44.

A few colts were raised in the region during the year. There were colts on about 17 per cent of the farms in the survey. The number of colts on these farms averaged 3.

Average Values of Farms and Equipment

By far the most common unit of farm organization in central Alberta is the family farm. Usually the father is the operator, and if the business is large enough, there may be one or two hired help in addition to the members of the family. These family farm businesses are marked by a fairly high investment. The average value of the capital of the 318 farms included in this study was over $18,000. This was made up of $11,000 in real estate, nearly $3,000 in machinery

and equipment, approximately $2,300 in livestock, and the balance in seed, feed and other farm supplies on hand. A carryover from the big crop of 1942 due to the congestion in grain marketing channels resulted in relatively large stocks of grain and other feeds on most farms. Capital investment by type for the whole area is given in Table 7.

High investment in grain farms—land and machinery.—The grain farms carried the highest investment—nearly $24,000 per farm. About two-thirds of this was in real estate. In the Drumheller district, the capital investment of the grain farms averaged over $28,000, and the value of the real estate alone averaged about $35 per cultivated acre. For other types in the Drumheller district, real estate averaged about the same. Livestock accounted for only

TABLE 7.—CAPITAL INVESTMENT BY TYPE OF FARMS—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Capital Items	Types of farm			All types
	Grain	Livestock	Mixed	
	$	$	$	$
Real estate	15,658	7,704	9,602	11,012
Seed, feed and supplies	3,097	851	1,524	1,842
Livestock	1,061	3,611	2,389	2,292
Machinery and equipment	3,940	2,294	2,574	2,929
Total capital	23,756	14,460	16,089	18,075
Number of farms	100	83	135	318

3½ per cent of the capital investment of the grain farms of the Drumheller district, but on farms of the other types in the same district and on grain farms in the other two districts, livestock accounted for a considerably higher proportion of the total capital. Capital invested in machinery on Drumheller grain farms made up more than 15 per cent of the total investment. It amounted to nearly $4,400 per farm, or $8 per cultivated acre.

High investment in livestock farms also.—As might be expected due to their smaller area, the total capitalization of the livestock farms averaged less than that of the grain farms. On a cultivated acreage basis, however, the capitalized value averaged higher than for the grain farms. For all districts, investment in livestock farms averaged $40 per cultivated acre, and investment in grain farms $35. Such a large investment in the livestock farms is due to the large number of this type in the Innisfail district, where investment per cultivated acre averaged nearly $80.

It was found that the distribution of capital in the livestock farms differed from that in the grain type. The value of livestock on the Innisfail livestock farms averaged nearly $3,500 per farm and amounted to over $18 per cultivated acre. This was about 23 per cent of the total capitalized value. On the same farms, the investment in machinery and equipment averaged about $13 per cultivated acre. For all types in the three districts, the average machinery investment was $8 per acre.

Intensive and extensive livestock types.—The livestock type of farming in the Innisfail district is quite an intensive one. The more important livestock enterprises are hog raising and dairying. Full use is made of pasture lands, and in addition grain is fed. Farther east, in the Gadsby district, a more extensive type of livestock farming is carried on. Pasture lands are generally utilized but less grain is fed. This more extensive type of livestock farming is associated

with beef cattle. On the Gadsby livestock farms there were more than twice as many beef cows on the average as there were on the Innisfail livestock farms, but there were fewer milk cows and fewer sows.

Fifty-five per cent of the land on the Gadsby livestock farms was unimproved compared with 40 per cent unimproved on the Innisfail livestock farms.

Receipts

The principal sources of receipts and the amounts derived from each are given in Table 8. On the grain farms, crop sales were the chief source of revenue. Wheat sales made up two-thirds of the total cash receipts of the grain farms, but less than one-third of the total cash receipts of the other types. For the livestock and mixed types, sales of livestock were the chief source of revenue. On the Innisfail livestock farms, livestock sales and sales of livestock products averaged more than $3,200 per farm. On all farms, hogs accounted for about one-half of the total receipts from livestock and livestock products. On the livestock

TABLE 8.—RECEIPTS BY TYPE OF FARM—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Receipts	Types of Farm			All Types
	Grain	Livestock	Mixed	
	$	$	$	$
Crop sales	2,329	485	1,021	1,294
Livestock sales	713	2,411	1,727	1,586
Other farm produce	179	522	440	380
Equipment sales	70	92	61	72
Custom work	163	38	78	94
Previous year's crop sales	1,113	123	517	602
Hail insurance	132	7	12	48
Wheat acreage reduction bonus	244	65	138	152
Other bonus	22	20	24	22
Other farm receipts	32	29	58	42
Total cash receipts	4,997	3,792	4,076	4,292
Increase in inventory	1,446	824	952	1,074
Non-farm income	218	155	132	165
Number of farms	100	83	135	318

type of farm, the sales of hogs averaged $1,231, and on all other types, $874. Even on the Drumheller grain farms, receipts from hogs averaged $278 at the farm—about 12 hogs sold per farm. At this time, the hog population was higher than in any previous period. One of the chief reasons for the large number of hogs was the congestion in marketing grain directly, which made the outlet offered by marketing the grain through hogs attractive. The number of hogs sold from the Innisfail livestock farms average 33, which is possibly a little above the usual sales for any one year even in this district.

Cattle sales, although of less importance for all farms, were nevertheless an important source of revenue, particularly on the livestock farms, for which cattle sales averaged $1,064 per farm. For all types, sales of cattle averaged: in the Innisfail district, $772; in Gadsby, $615; and in Drumheller, $85.

Other farm produce comprised chiefly cream and eggs, and, in the Innisfail district, whole milk, which was shipped to a processsing plant, cheese factory or condensery. The revenue from this source was comparatively high, particularly for the livestock and mixed types of the Innisfail area.

The increase in inventory shown with the receipts comprised additional stocks of grain for sale, feed on hand, livestock or added equipment. Only

some of the farms had increased stocks and equipment. Those with decreases are accounted for in the statement of expenses as decreases in inventory. (Table 9.)

Expenses

There are two classes of expenditure incurred in operating a farm business. One of these is for current account and the other is for capital account. Current farm operating expenses may be divided into two sub-classes, cash and non-cash. The cash consists of items such as taxes, feed purchased, costs incurred in operating equipment, and labour. Non-cash expenses consist of items such as family labour for which the operator does not pay a stipulated wage, but without which other labour would have to be hired. The item is considered a legitimate charge against the farm business and is given a value according to the prevailing wage of paid labour.

Expenditures on capital account include purchases of machinery, equipment and livestock for productive purposes, and major improvements made to real estate during the year. Depreciation on capital equipment is allowed at established rates and is accounted for in the decrease of inventory, which also includes decreases in stock and equipment on hand.

For the year 1943-44, current cash expenses at nearly $1,900 averaged highest on the grain farms (Table 9). On the same type of farm, the costs of operating tractors, combines and trucks averaged much higher than on the other types. The wages of paid labour on grain farms also averaged much higher than on the other types.

The amount of unpaid (family) labour used on grain farms was less than that used on the other types. Livestock enterprises are more common on farms with family labour. They provide remunerative work for the labour force available; and hence to some extent the presence of family labour determines the type of farm.

Capital expenditures which represented additional investment during the year were considerable, and averaged nearly $900 for all farms. However, this was not large in view of the relatively heavy investment in machinery and

TABLE 9.—EXPENSES BY TYPE OF FARM—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Expenses	Types of Farm			All Types
	Grain	Livestock	Mixed	
	$	$	$	$
Taxes on real estate	238	126	165	178
Feed purchased	34	224	102	112
Other farm expenses	380	371	400	386
Tractor costs	383	147	242	262
Combine and separator costs	48	9	13	23
Automobile, farm use	62	52	64	60
Truck costs	116	57	48	72
Custom work	188	142	192	178
Seed purchased	115	81	96	98
Paid labour	278	138	171	196
Board of paid labour	47	24	31	34
Total cash expenses	1,889	1,371	1,524	1,599
Value of unpaid labour	169	210	293	232
Total farm expenses	2,058	1,581	1,817	1,831
Capital expenditures	946	940	772	870
Decrease in inventory	1,444	792	1,077	1,118
Cash rent	12	32	16	19
Number of farms	100	83	135	318

equipment on central Alberta farms, and considering the additional improvements still required on many of these farms, as yet in a stage of development.

Decreases in inventories during the year were quite marked on some farms, although, as noted, there were increases on others. For all farms there was a small net decrease averaging $44 ($1,118 as per Table 9 minus $1,074 as per Table 8) when increases and decreases of inventories were brought together. There was less grain on hand at the end of the year, and the reduced value of grain was barely offset by the increased value of livestock.

Measures of Earnings

Three Common Measures.—There are several measures used in analysing a farm business. The measure chosen depends on the purpose of the analysis. Three of the most common measures are net farm income, labour income and labour earnings.

"Net farm income" is the difference between farm receipts and expenses with change in inventory taken into account, and an allowance made for unpaid labour.

"Labour income" is the operator's net farm income with a deduction made for interest on his capital.

"Labour earnings" is the operator's labour income plus farm perquisites, the latter usually including use of farm house and farm products raised on the farm and consumed by farm family.

The net farm incomes given in Table 10 relate to the farm businesses as a whole. Included in receipts, expenses and changes in inventory are both the operator's and the landlord's interests, for it will be recalled there were a few rented and partly rented farms in the sample. Net farm income averaged highest on the grain farms—about $2,000—and the grain farms of highest net farm incomes were located in the Drumheller area.

In calculating labour income, interest at the rate of 5 per cent on operator's capital was deducted from the operator's net farm income, and the operator's net farm income was calculated by subtracting the difference between the landlord's receipts and expenses from the farm net farm income. In his business, the farmer is a capitalist, a manager and a labourer. He may own all the capital invested in the business or he may have borrowed part of it. As an owner of part or all of the capital which he has invested in the business, the farmer is entitled to charge the business for the use of the capital just as if he were paying for operating on borrowed capital. That which remains after the interest charge is deducted is the return to operator for his labour and management. Labour income is a fairly satisfactory measure for comparing the efficiency of one farm business with that of another.

Labour income averaged $627 for all farms and $766 for those of the grain type. It averaged highest for the grain farms (Table 11).

But in addition to labour income, the farmer receives for his labour and management the use of the farm house and the products raised and consumed on the farm. The value of these varies in accordance with the kind of house, the conveniences and comforts it offers and the quantity, quality and variety of farm products which the operator and his family produce for home consumption. As noted, the value of these perquisites added to labour income gives the labour earnings.

Labour earnings more closely approximates the real earnings of a farmer than does labour income, and to some extent the use of this measure makes possible the comparison of a farmer's earnings with the earnings of an urban

TABLE 10.—AVERAGE NET FARM INCOMES BY DISTRICT AND TYPE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

	Gadsby				Drumheller				Innisfail				All Areas			
	Grain	Live-stock	Mixed	All Types	Grain	[c] Live-stock	Mixed	All Types	Grain	Live-stock	Mixed	All Types	Grain	Live-stock	Mixed	All Types
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Total farm receipts[a]	5,472	4,357	4,471	4,664	7,096	.....	7,680	7,212	3,245	4,752	4,259	4,478	6,443	4,616	5,028	5,366
Total farm expenses[b]	4,360	3,091	3,101	3,372	4,623	.....	5,577	4,947	2,852	3,446	3,402	3,394	4,448	3,313	3,665	3,819
Net farm income	1,112	1,266	1,370	1,292	2,473	.....	2,103	2,265	393	1,306	857	1,084	1,995	1,303	1,363	1,547
Number of farms	26	24	70	120	68	1	26	95	6	58	39	103	100	83	135	318

[a] Total farm receipts include increases in inventories.
[b] Total farm expenses include decreases in inventories.
[c] As only one farm, no figures are given.

1. Buildings of wheat and cattle farm near Big Valley.

2. Munson-Morrin District. Close-up of a farmstead.

3. Close-up of a farmstead in Innisfail district. Note the native aspen and poplar trees in the background.

4. Farm scene quite typical of the Innisfail district.

5. Drumheller. Raking hay horses are more econom

6. Munson-Morrin. Whe clay.

7. Drumheller wheat plains used to leave the stubbl

8 and 9. Drumheller. Hea moisture and the effec Wheat on clay and on l

10. Penhe black comb early trict r ripene harve

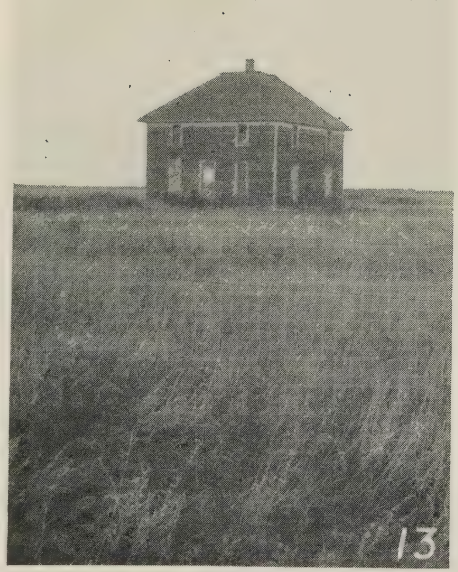
ere are farm operations where han tractors.

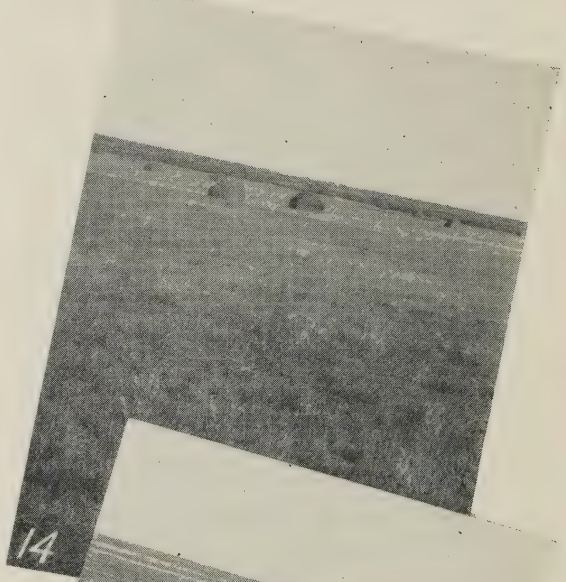
ld in August on Drumheller

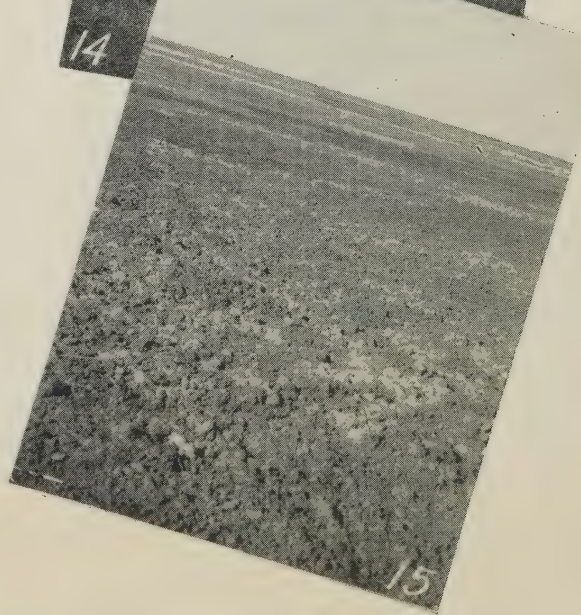
llow where one-way has been sh on top.

Drumheller clay soil retains the seen in the crops produced. in August.

Stubble on clay loam after . Little did the ers of this dis- e that one day rain would be by combine!







11. Oats in the Innisfail district.

12. Farmstead in Gadsby district.

13. Abandoned house in Gadsby district. Built in the more prosperous times of the middle twenties.

14. Gadsby. Crested wheat haystacks two years old—fodder reserve.

15. Gadsby. Fallow. Hard cloddy earth turned up from the top of the impervious subsoil in blow-out depressions.

TABLE 11.—OPERATOR'S LABOUR INCOME AND LABOUR EARNINGS BY TYPE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

—	Grain	Livestock	Mixed	All Types
	$	$	$	$
Labour income	766	570	559	627
Farm perquisites	392	469	482	450
Labour earnings	1,158	1,039	1,041	1,077
Number of farms	100	83	135	318

dweller. Labour earnings averaged approximately $450 more than labour income on all types of farms. In general, the value of perquisites was higher on the livestock and mixed type of farms than on the grain farms.

Farm perquisites only part of living.—Farm perquisites cover only part of the living of the operator and his family. Family living also consists of a number of items which must be paid for in cash. Usually the cash expended on living exceeds the value of the living obtained directly from the farm. Average expenditures for the items which make up farm family cash living are given in Table 12.

Cash spent on living averaged highest on the Drumheller farms. In this district, more money was spent on food and fuel, and more on clothing and personal items than in the other two districts. A share of the operating costs of the automobile was charged against the farm family living according to the use the family made of it independent of farm business.

Total cash living costs averaged $962, $1,226 and $996 for the Gadsby, Drumheller and Innisfail farms. If the value of farm perquisites is added to these cash living costs, the total living costs average $1,399, $1,691 and $1,448 for the three districts. These figures indicate a relatively high plane of living.

A fourth measure of farm earnings.—Another measure of farm earnings, namely "surplus", is used where the objective is to describe the amount available from the year's operations for payments on indebtedness or for savings. Surplus is calculated by subtracting from the net farm income plus allowance made for unpaid labour, the farm family's cash living expenses. In other words, it is that which remains to the farm family after deducting from the gross receipts (including net increase in inventory) the operating, capital maintenance and family living costs. Rarely does the farm operator pay himself and members

TABLE 12.—FARM FAMILY CASH LIVING COSTS BY DISTRICT—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

—	Gadsby	Drumheller	Innisfail
	$	$	$
Groceries and fuel	412	514	421
New house furnishings	53	55	63
Clothing	127	161	141
Health	71	66	69
Church and charity	26	57	41
Education	37	53	40
Personal	152	200	124
Life insurance	25	56	36
Auto (operating costs chargeable to living)	58	64	59
Cash Living Costs	962	1,226	996
Number of farms	120	95	103

of family wages in the sense that wages are paid in most other businesses. Expenses for living which the non-farmer pays out of his wages, are paid by the farm operator out of current receipts from sales of farm products. Living costs can, therefore, be considered as current operating expenses of the farm business.

The average surplus of all types in the three areas amounted to approximately $760. The average surplus on the Drumheller grain farms was more than $1,500, but on the Innisfail grain farms there was a deficit of nearly $300. This deficit means that receipts were insufficient (including increase in inventory) by $300 to meet current expenses, maintain the capital, and cover the farm family cash living costs. A deficit must result in either an increase in debts, a decrease in savings, or a decrease in inventory. Needless to say, a farmer cannot continue operating with deficits for very many years.

The apparent explanation of the deficit on the Innisfail grain farms and the relatively large surplus for the same type in the Drumheller district is the poorer yields obtained in Innisfail compared with Drumheller in 1943. A discussion of this follows in the succeeding chapter. In all districts, livestock and mixed farms earned surpluses on the average. The surplus of the Innisfail livestock farms amounted to $565.

Operator's labour income and operator's labour earnings only measure the returns to the operator for his labour and management. Only where the operator is an owner-operator do the total receipts and expenses of the farm enter into calculation of the labour income. The landlord's share of receipts and expenses in the operation of a tenant-operated farm is not part of the operator's labour income statement. "Surplus", as used in the foregoing, expresses the net revenue from the farm business as a whole irrespective of whether or not the operator shares this revenue with a landlord.

The end product of the labour income statement is the operator's wage, and to arrive at this wage an interest charge for the use of capital must be made. A major part of the farm capital is in real estate, and consequently the value placed on real estate affects the interest charged. In calculating labour earnings, a valuation is placed on farm perquisites. The end product of the surplus statement is the net revenue of the farm business as a whole, irrespective of who owns it. Nothing is deducted from the net revenue for the use of capital, but in order to calculate the net revenue, a wage was allocated to the operator and his family, and the amount so allocated was the equivalent of the cash living costs of the operator and his family. In individual statements, this may be a much larger or a much smaller amount than a satisfactory wage for the operator, but the group average for cash living would appear to be a fair wage to allocate to the family for their work. The surplus may be considered as the net earnings of the farm business. The average surpluses, by type and district, are given in Table 13.

TABLE 13.—AVERAGE SURPLUS BY TYPE AND DISTRICT—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

District	Grain	Livestock	Mixed	All Types
	$	$	$	$
Gadsby	458	543	687	609
Drumheller	1,513	1,210	1,162	1,414
Innisfail	−277	565	91	338
All districts	1,132	564	603	759
Number of farms	100	83	135	318

FACTORS AFFECTING FARM PROFITS

In the previous sections, certain terms used in measuring the success of farm businesses were discussed and it was shown that no one alone is an entirely satisfactory measure. In this section the factors affecting farm profits will be discussed and these profits will be expressed by "surplus".

Size of Business

One of the most important factors in determining net revenue is the size of a farm business. In central Alberta, possibly the best measure of size is cultivated acres.

For the farm business year, 1943-44, in the Gadsby-Drumheller-Innisfail area as a whole, the surplus on farms of less than 200 cultivated acres averaged less than $100, and on farms of over 700 acres it averaged nearly $3,100. Average surpluses in the intermediate size groups fell between these extremes (Table 14). Such marked increases in surpluses with increased size of business are to be expected in periods when prices of farm products are rising. While less marked, the same direct relationship exists between increased surpluses and larger farm businesses in periods of relatively stable price relationships. However, when prices received for farm products are falling without a corresponding reduction in costs, deficits rather than surpluses may occur, and these may be greater for the larger-sized businesses.

It should be noted that "size of businesss", when applied to farming, has a different connotation than has the same term in an industrial or commercial business. The upper limit to the size of a farm business is set by the capacity

TABLE 14.—RELATION OF SIZE OF FARM AND YIELDS TO SURPLUS—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Size Group, acres	Crop Yield Index	Number of Farms[a]	Surplus
			$
0–199	1– 80	34	— 70
	81–100	15	—250
	101–120	13	80
	121+	23	510
	All yield indexes	85	80
200–399	1– 80	52	130
	81–100	8	600
	101–120	25	940
	121+	35	1,000
	All yield indexes	120	860
400–699	1– 80	26	70
	81–100	15	1,400
	101–120	7	1,640
	121+	17	2,680
	All yield indexes	65	1,230
700+	1–80	12	1,370
	81–100	7	3,400
	101–120	6	3,940
	121+	7	4,960
	All yield indexes	32	3,080

[a]Sixteen farms with yield index of zero are excluded.

of one man to supervise all its operations. In this country such a business rarely includes more than the equivalent of two all-year-round paid employees in addition to the operator's own family.

Crop Yields

There is a direct relationship between crop yields and surplus. Usually the higher the yield, the greater is the surplus. Within comparably-sized groups of farms for the area as a whole, the trend toward increased surpluses with higher yields was quite pronounced. Yields are expressed in terms of crop indices. The index 100 expresses an average 1943 crop weighted by acres in wheat, oats and barley for each of the three districts. Thus, its composition differs in each district. Farms are rated accordingly above or below the average of the district in which they are located.

With farms of between 200-399 cultivated acres, the surplus varied from an average of $130 for those which had a crop index of 80, to $1,000 for those which had a crop index of 121 or over (Table 14). Other surpluses were intermediate between these extremes according to the crop index.

Although the effect of yield on income was more direct for crop farms than for either livestock or mixed farms, it nevertheless was an important factor in determining the income of these other types as well. On most Alberta farms, the amount of livestock which will be carried and finished for market and the amount of livestock products for sale, are determined largely by the amount of feed and fodder produced on the particular farm. The farmer's own operations are important, but probably the greatest single factor in the production of a crop is the weather.

In 1943, the Innisfail district experienced a late wet spring followed by a comparatively dry growing season and an early fall frost. The result of this was low grain yields, particularly of oats and barley, compared with the long-time average. During the same year, the Gadsby district experienced more favourable weather for crop production and the crop was close to normal. The 1943 crop yield in the Drumheller district was a little below normal.

The comparatively poor crops in the Innisfail district in 1943 were the chief reason for the relatively low surpluses obtained by these farms compared with the farms in the other districts. In this district, as noted, there was on the average a deficit of $277 on the grain farms for the 1943-44 business year; a surplus of only $91 on the mixed farms; and although the surplus on the livestock farms averaged $565, this was much below what it would have been if the district had obtained a normal yield. A weighted index indicated that the 1943 yield in Innisfail was 66 per cent of normal.

The combined influence of the two factors of size and yield on farm income may be readily seen by referring again to Table 14. The average surplus for groups of farms of the largest size, where the crop yields were above average, was from $4,000 to $5,000. For the group of farms of the same size where the crop yield was 20 per cent below average, the surplus averaged barely $1,400. For the farms in the next size group—400 to 699 acres—where the crop yield was 20 per cent below average, the surplus was only $70. During the year under review, prices were favourable to the producer. Any shift towards less favourable prices to the producer would result in these larger farm businesses with low yields having deficits and not surpluses.

Normally, with high yields, one may expect a relatively large surplus from a moderately large sized business, but with low yields there may be a deficit and quite likely will be if the prices become unfavourable to the producer.

Closely allied to crop yields are the yields of animal products. These are usually described as rates of production; for example, butterfat per cow. However, this study is too general in scope to consider relationships between rates of production in various livestock enterprises and variations in farm income.

Combination of Enterprises

In the analysis of the 318 farm businesses in central Alberta, the farms were divided into three groups according to predominant type (Table 1). Although there were 100 farms classified as belonging to the grain type, actually fewer than one-half obtained as much as 90 per cent of their gross revenue from the sale of grain. More than one-half emphasized other enterprises as well as grain production. On the grain farms, an average of 20 hogs per farm was sold during the year, bringing in approximately $500 per farm. A few of these farms were located in the Drumheller district, and on one-fourth of them there were three sows or more. For some farms, the emphasis which was put on hogs in 1943-44 was not a normal practice, but for other grain farms the raising of hogs was part of the permanent farm program. On one-third of the Drumheller grain farms, more than 100 hens were kept, and the revenue from the poultry enterprise averaged over $250 per farm.

On the livestock and mixed farms, there was generally more diversity of interests than on the grain farms. Crop production was carried on, but great emphasis was placed on livestock enterprises. The chief distinction between the livestock and mixed types is to be found in the amount of emphasis placed on the different enterprises, and this makes for differences in (*a*) the amounts of labour devoted to different enterprises, (*b*) the proportion of gross income from these enterprises, and (*c*) the numbers of livestock kept in proportion to the acres of cultivated land. On the livestock farms, crops were grown primarily to feed livestock and the surplus crop was sold; whereas, on the mixed farms, crops were grown to be fed to the livestock and for direct sale. There was a tendency to greater diversification on the mixed farms than on the livestock.

There is less diversification on the grain farms. More grain farms (chiefly the wheat farms) have reached a higher degree of specialization than farms of any other type in Alberta. Other more or less specialized types in the province are dairy farms producing whole milk for sale (and raising almost no crops), and a few cattle and sheep ranches. The degree of specialization or diversification of a farm business is largely determined by natural and economic forces. In the Drumheller district, the level to undulating topography with few obstructions to field operations on a large scale, the heavy clay soil, and the climate are all conducive to wheat farming. On the other hand, in such areas most favourable for wheat production, adequate water supplies for any number of livestock are usually difficult to obtain. Eight per cent of the farmers in the Drumheller district hauled their water supply from sources off the farm, whereas in the Innisfail district all had sufficient water on their farms. Fodder crops, too, are more difficult to establish and less dependable for a continuous supply of feed in the choice wheat land areas than in the park belt to the west.

Conditions are set for specialization in farming when high profits can be obtained in one enterprise relative to others. In other situations, however, diversification pays better. The advantages of diversification in farming are many.

Advantages of Diversification

Distribution of labour is one of the most important advantages. Agricultural production depends on biological processes. For this reason, in most single-enterprise businesses, more work is required at one season of the year than at another. With more than one enterprise, it becomes possible to distribute the work more evenly throughout the year.

Diversification ensures fuller utilization of all land in the farm. On many farms, there is in addition to the cultivated land, land suitable only for pasture. Cattle and sheep make possible the utilization of what otherwise might be waste land.

Profitable utilization of by-products is made possible by diversification. Wheat screenings which are seldom saleable may be utilized to advantage as feed for animals or fowl. Skim-milk is one of the best sources of protein for hogs.

Diversification permits soil improvement. It implies a combination of crops, or of crops and animals, and such a combination makes it possible to carry on cropping and grazing practices which will maintain fertility and help to keep the land free from weeds.

More efficient use of capital may be provided by diversification. There are circumstances when greater efficiency in the use of capital other than land is made possible by a combination of enterprises than by a single enterprise. The same buildings and equipment may be utilized at different periods by the addition of one or more farm enterprises. However, if additional housing and equipment have to be procured in order to take care of the added enterprise, the result may be less rather than more efficiency in the use of these factors of production.

There is a greater assurance of regular income through diversification than through specialization. For most people, there are distinct advantages to be gained from operating a business which yields a steady income rather than one which yields a flunctuating income. Usually there is less risk in a multiple enterprise farm business than in a single one. Seldom do losses from both natural and economic causes strike all enterprises at the same time and to the same degree. The wheat crop may be hailed, but the accompanying rain may bring along a second growth of alfalfa in an adjacent field to ensure a continued revenue from milk cows.

However, diversification without capable management is no more guarantee of success than specialization. In fact, there are chances of bigger losses in a diversified business than in a specialized one, just as there are chances of making bigger profits, because in diversification there are more avenues for losses just as there are more for gains. Success in diversification depends upon the choice of enterprises. Certain combinations of enterprises are more profitable than others.

Prices and Choice of Enterprise

Aside from physical conditions, prices are probably the most important factor in deciding the choice of enterprises. By 1943-44, prices of livestock and livestock products had risen much higher above the average for pre-war and early war years than had prices of grains. Livestock enterprises were more remunerative than were grain enterprises. Wholesale prices of field products in 1943 were 25 per cent above the average of 1935-40, and those of animal products were 50 per cent above. As a result of this, the average surplus revenue on the livestock farms was much higher than on the other types. In the three size groups—less than 200 cultivated acres, 200 to 399, and 400 to 699—for the area as a whole, the average surpluses of the livestock group amounted to $268, $1,128 and $1,993, respectively, compared with —$231, $704 and $1,064, respectively, for the grain type. The average surpluses of the mixed type, with one group excepted, fell between the extremes.

The price differential to the farmer between returns for livestock and its products and returns for grain lessened during the fall of 1944, when the farmer received more for his grain, and one may deduce that by and large with a like production, the surplus differential would also have been less. Over a long

period under normal conditions of production and price, the higher surpluses which may be expected from the livestock enterprises are not likely to come from the price differential between livestock prices and feed prices, but rather from the economies which may attend the livestock producer by feeding the by-products of the farm, and from the fuller utilization of labour and capital in the production of the more concentrated article.

Long-time price trends as well as short-time fluctuations must be considered in deciding what crops to grow, the acreage devoted to each crop, and the kinds and numbers of livestock to produce. Also to be reckoned with are other economic conditions and conditions established by nature. In some situations it is more profitable to engage in a one-enterprise farming business such as wheat production. Less favoured areas for wheat production are suited to diversification, with the chief emphasis still on wheat production. Other areas offer less favourable conditions for wheat production and more for the production of feed crops, as well as other advantages in the production of livestock. In Alberta, the number of crops which can be grown is distinctly limited, so any marked degree of diversification means a combination of enterprises which includes some livestock enterprises along with crops. Usually, choosing the enterprises is not so important (because of the limited choice) as deciding on the proportion of productive effort to be devoted to each enterprise in order to bring about the highest profit from the farm business as a whole.

Efficiency in the Use of Factors of Production

Other factors in farm production, equally as important as those which have been described, are efficiency in the use of labour and efficiency in the use of capital—both real estate and equipment. These are inter-related with size of business, rates of production and combination of enterprises.

Efficiency in use of labour.—More gainful work is accomplished in a season on some farms than on others. Table 15 gives the average cropland acres and productive livestock units handled per man on the Gadsby-Drumheller-Innisfail farms in 1943-44 according to type for the different size groups.

The amount of work accomplished per man, measured in cultivated acres and productive livestock units, varied from 148 acres with 1·9 productive livestock units for grain farms with 200 cultivated acres or less, to 345 acres with 32·2 units of livestock for the mixed farms of 700 acres or more. It is obvious that the larger-sized farm unit gives an opportunity of accomplishing more productive work per man.

TABLE 15.—CULTIVATED ACRES AND PRODUCTIVE LIVESTOCK UNITS *a* PER MAN EQUIVALENT BY TYPE AND SIZE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Cultivated Acres	Grain			Livestock			Mixed		
	No. of Farms	Cropland Acres per M.E.	Productive Livestock Units per M.E.	No. of Farms	Cropland Acres per M.E.	Productive Livestock Units per M.E.	No. of Farms	Cropland Acres per M.E.	Productive Livestock Units per M.E.
0–200	12	148	1·9	50	128	23·5	42	172	11·4
201–400	33	274	6·7	26	152	30·5	59	196	17·7
401–700	34	325	9·3	6	147	32·1	25	259	20·3
701+	21	475	9·2	1	362	54·0	9	345	32·2

a One animal unit is equivalent to 1 cow; 1·4 heifers or steers; 3 calves; 5 sheep; 3 sows; 5 hogs raised to market weight; or 100 poultry. One man equivalent is equal to 12 months labour.

As would be expected, the farms of the mixed type showed a marked association between cultivated acres and the number of productive livestock kept. This general relationship, although not as marked, was true also for the livestock-type farms. It occurred also with the grain farms during the year under review, due to the unusually large numbers of hogs raised on these farms during that year. Ordinarily, with grain farms, one would not necessarily expect to find larger numbers of productive livestock on farms with more cultivated acres. With other types, however, the more acres cultivated the more productive livestock raised because the amount of feed which can be grown usually determines the number of livestock raised. This is true in most farming regions of Alberta.

Computed in dollars by using the net farm income (the difference between receipts and expenses plus or minus change in inventory) plus wages to labour, the average returns per man equivalent at $2,200 average nearly five times greater for mixed farms in the largest size group than for grain farms in the smallest size group (Table 16).

TABLE 16.—AVERAGE NET FARM INCOME, (EXCLUDING LABOUR COST) PER MAN EQUIVALENT BY TYPE AND SIZE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Cultivated Acres	Types of Farm		
	Grain	Livestock	Mixed
	$	$	$
0–200	541	1,007	900
201–400	1,513	1,409	1,168
401–700	1,555	2,288	2,309
701+	2,531	a1,992	2,200

a One farm only.

A moderately large acreage does give an opportunity for making a fuller use of labour than does a smaller one, and the livestock enterprises which can be carried with the larger acreage add to the opportunities of making more efficient use of this labour.

Efficiency in use of capital.—The greater accomplishment of labour on some farms compared with others was made possible by a more general use of time-saving machinery in the fields and by better equipped and better arranged building accommodation. The availability of these aids on some farms compared with others is indicated by investments. On farms up to 400 cultivated acres, the value of farm machinery and equipment averaged approximately $2,000 per farm, whereas on farms of more than 400 cultivated acres it was over $5,000. However, the investment per cultivated acre was smaller on the larger farms, averaging $7 per acre compared with almost $9 on the smaller farms.

The same general relationship between size of unit and value of equipment can be seen in building investment. Although the value of buildings on farms over 400 cultivated acres was more than twice that of buildings on farms of smaller acreage, the value of buildings per acre was considerably less. For all buildings excluding houses, the ratio of values per acre of cultivated land for farms above 400 acres to those of less than 400 acres were as one to three.

With farms of comparable acreage, the investment in machinery and equipment was considerably higher on the livestock than on the grain. The value of farm machinery and equipment on livestock farms of 201 to 400 cultivated acres averaged more than $11 an acre, whereas the value of machinery on grain farms of the same acreage averaged about $9. The same was true of building investment. The value of buildings other than operator's house on

Innisfail livestock farms of 201 to 400 acres averaged more than $1,900; whereas on Drumheller grain farms of the same size, the value of buildings excluding the house averaged about $1,000. However, in terms of animal units—and a large number of livestock is the chief reason for any considerable degree of investment in buildings other than houses—building investment on the same Innisfail livestock farms amounted to $37 per animal unit, and on the Drumheller grain farms it averaged $149 per animal unit. While there were lower investments on the larger farm businesses (which means lower fixed costs), within farms of the same size group and the same type there were wide variations in these investments. Within the most common size group of grain farms—401 acres to 700 acres—the machinery investment varied from less than $500 to more than $10,000.

Investment and Profits

Relatively low investment per unit in the implements of production is not an end in itself, but a means to an end; namely, low cost in production. Frequently lower costs are obtained by comparatively high investment in both farm machinery and buildings. Low costs and high returns are obtained as a result of comparatively high yields, which to some extent are determined by the manner in which the land is farmed and the timeliness of the operations. To obtain satisfactory results, relatively high-priced machinery may have to be employed. The employment of such machinery, of course, is part of the plan of successful farm management if it means higher net returns.

It is also part of the plan of successful farm management to employ more labour per productive unit and more of the other agencies of production if, by so doing, the net returns are increased.

High Income Farms

It is to be expected that the farms with the highest income in each of the three districts would rate high in principles associated with successful farm management. The three top income farms of each district are discussed next, and the pertinent data are presented in Table 17.

Size.—Measured both in cropland acres and total acres, the high-income farms were considerably above the average for their respective districts.

Yields.—On six of the nine high-income farms, the crop yield was above the average for their respective districts. One of the high-income farms with a yield below the average was a grain farm in the Drumheller district, where in addition to the major enterprise of grain production, three relatively important minor enterprises were carried on; namely, hogs, poultry and dairying. The farm was situated near a small town and whole milk was marketed there.

Efficiency in use of labour.—In the Gadsby district, the three high-income farms handled from one-fifth to four-fifths more cropland acres per man equivalent than the average, and in addition to this, on two of the farms nearly twice as much livestock per man equivalent was handled.

In the Drumheller district, the three high-income farms handled from one-third to four-fifths more cropland acres per man equivalent than the average.

Of the three high-income farms in the Innisfail district, on one the cultivated acres per man equivalent was two-thirds greater than for the average of all farms. On the other two, the cultivated acres were slightly less per man equivalent than the average, but on these the productive livestock numbers were 60 per cent and 30 per cent greater per man equivalent than the average for the district.

It is clear that the efficiency in the use of labour on the three high-income farms of each district was much greater than the average.

TABLE 17.—COMPARISON OF EFFICIENCY FACTORS OF HIGH-INCOME FARMS WITH EFFICIENCY FACTORS OF AVERAGE FARMS, BY DISTRICT—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

—	Size		Crop Index	Cropland Acres per M.E.	Productive Animal Units per M.E.	Number of Years for Receipts to Equal Capital
	Cropland Acres	Productive Animal Units				
Gadsby						
First high farm	1,107	87	107	426	34	4·1
Second high farm	555	97	86	278	48	2·5
Third high farm	961	20	95	384	8	2·5
District average	329	27	100	233	21	3·4
Drumheller						
First high farm	905	4	192	448	2	3·2
Second high farm	965	1	219	603	1	3·3
Third high farm	1,110	48	86	505	22	2·7
District average	522	18	100	332	12	5·0
Innisfail						
First high farm	580	137	207	242	57	3·1
Second high farm	330	101	118	127	39	3·7
Third high farm	313	72	142	130	30	3·8
District average	222	34	100	143	21	4·1

Efficiency in use of capital.—For the high-income farms, the number of years required for receipts to equal capital varied from two and one-half to slightly over four. The averages for the Gadsby, Drumheller and Innisfail districts were 3·4, 5·0 and 4·1, respectively. A rapid turnover of capital is indicated by these figures.

Such rapid rates of turnover in capital cannot be considered normal in any general farming area. One of the characteristics distinguishing agriculture from most other commercial businesses is the slow rate of turnover. During the year, 1943-44, the stage was set for a quickening in the rate of capital turnover, with a crop near to or above the long-time average. Prices of agricultural products had been increasing at an accelerating rate for about four years. At the beginning of this four-year period, the value of farm real estate (which made up two-thirds of the farm capital during the business year under review) had fallen to a very low point. The cumulative effect of the low prices of the thirties in all three districts and the short crops in the Gadsby and Drumheller districts during the same period was not fully reflected in land values until after some recovery from the depression period had set in. Likewise, the effect of the rise in prices and the better-than-usual crops which followed had not been fully reflected in land values by 1944. There had not been a sufficient time lapse to allow higher prices for farm products to become capitalized into higher land values. Consequently, receipts of farm produce were high and real estate values low, viewed in terms of their long-term relationship. The same was true of receipts in relation to current operating expenses.

Operating costs and prices of farm products.—Current operating costs on the nine high-income farms varied from approximately $2 per cultivated acre to about $6. For all farms in the Gadsby and Drumheller districts, the average current operating costs amounted to approximately $4 per cultivated acre. In the Innisfail district, the costs averaged about $6. For all nine of the

high-income farms, the costs per cultivated acre were lower than the average for their districts. But even for all farms, the costs were low relative to a more normal relationship with the prices of farm products. Taxes and tractor and other motor power expenses comprised more than one-third of the current operating expenses. These items advanced little up to the spring of 1944—the price of tractor fuel and gas was not advanced at all. Another substantial part of the operating expenses was labour—hired directly and by custom. Up until the spring of 1944, wages had not increased as much as had the prices of farm products.

The whole cost-price relationship for the year 1943-44 was favourable for earning a surplus above costs, and where the farm organization possessed those factors associated with successful farm management, the surplus earned was large.

Income and type of farm.—It is interesting to note that the three high-income farms of the Drumheller district were of the grain type; the three high-income farms of the Innisfail district were of the livestock type; and in the Gadsby district two out of the three with highest income farms were of the mixed type. This would suggest that where an area favours a certain type of agriculture, either on account of natural or economic characteristics or both, the chances are that the high-income farms will be found among the farms of that particular type.

MANAGING THE FARM

The underlying principles determining profits in farming were outlined in the foregoing section. The application of these principles is the job of the farmer. To this end he is both aided and limited by nature, and by certain economic forces beyond his control. The highest profits are obtained by the most successful adaptation of his plans to these natural and economic forces.

Crop Hazards

Drought.—Crop production is subject to many hazards. In Alberta, one of the most serious of these is drought. In the Gadsby and Drumheller districts almost complete crop failures on account of drought have occurred frequently enough to warn the experienced and successful operator to be prepared.

In the year of the survey, stocks of grain and fodder carried over from the previous year were relatively large on a substantial proportion of the Gadsby and Drumheller farms. In many cases the carry-over of grain was due to the restriction on grain marketing still effective in 1943 and 1944.

A good many livestock farmers made a practice of carrying a granary or two of grain from one year to another as a reserve supply of feed. Some grain farmers who kept very few head of livestock carried over grain as well; one of the reasons given was to even out their incomes.

Frost and other hazards.—Crop failures due to drought are almost unknown in the Innisfail district, but there are other weather hazards. It was noted that for the year 1943, the grain yield in the Innisfail district was only two-thirds of the long-time average. A wet spring delayed seeding, a dry summer followed to retard growth, and much of the late crop was damaged by an early fall frost. Frosts are a hazard in the Innisfail district although there is less grain damaged from frost now than in the earlier years. Early maturing varieties are grown now, and the crops grow less rank on the older land than they did on the new, and hence mature earlier. In spite of this, however, it usually pays to get the land seeded early in order that the crop may be grown to the ripening stage before the early frosts. On the prairies to the east, also, early rather than late seeding is a more satisfactory practice, but for a somewhat different reason. Here the aim is to have the growth well along before the intense hot dry days of July. However, there are situations in all areas when seeding should be delayed. Delayed seeding may be advisable as part of a plan to control weeds, to guard against plant diseases and to ward off insect damage. Timeliness in all cultivation practices is important, and the proper time as well as the right practice is learned by experience—either one's own or the neighbour's. The latter is cheaper.

Cultivation practices.—There is considerable variation in the cultivation practices followed in Alberta. Nearly all of these practices are carried on in one or the other of the three districts covered by this study. The principal cropping system followed is the growing of a grain crop for one or more years after summerfallow. On many farms a relatively small acreage of cultivated grass or legume or both, depending on the area, is fitted into this grain-fallow pattern, but usually not in any regularly rotated plan. The number of years grain is grown consecutively on the same land depends upon the moisture and other climatic conditions of the area, and to some degree also on the soil type and prevalence of the weed, insect and plant disease hazards. In both the Gadsby and Drumheller districts, grain crops are grown for one or two years after fallow, whereas in the Innisfail district, three or even more grain crops may be grown.

With continued grain cropping, there grows the need for fallowing, or a substitute for it, in order to control weeds. A crop sown and cut for greenfeed will arrest the weeds for a time. The same may be accomplished by growing fall rye or winter wheat. But the most effective means of arresting weed growth is seeding the land down to grasses and legumes for hay. The latter is growing in popularity, but, as noted, there is still a comparatively small acreage in tame grasses and clover.

The main purpose in fallowing is to conserve moisture by means of stopping all growth from late spring or early summer on. Fallowing is one of the most effective means of controlling the weed hazard, and in the Innisfail district it is looked upon as being done more for this purpose than for conserving moisture. In the Gadsby and Drumheller districts, however, the farmer is more conscious of conserving moisture than of destroying weed growth.

On the prairies—as with the Gadsby and Drumheller districts—fewer cultivations of the fallow are required to prevent weed growth than in the park belt region—as with Innisfail. Hence costs are decidedly higher for tillage operations in the park belt. In the Innisfail district in ordinary seasons the ground has to be covered five, six, and even more times to properly 'black fallow' the land, whereas fewer than one-half this number of times will suffice in the prairie areas. Here, particularly on the sandy loams and clay soils, the fewer cultivations the better, because of the probable damage from soil drifting which may occur in the late winter and early spring. In fact, there is a sandy loam area adjacent to the Gadsby district on the east where 'Indian summerfallow' is practised, the chief reason for this being to avoid soil drifting. In Indian summerfallow the stubble fields are left undisturbed and weeds are allowed to grow for two or three years, after which the land is ploughed in the spring and immediately sown. In some cases only one crop is taken off, and the land is then again allowed to rest. Costs of tillage operations are kept low. Low gross returns are also to be expected, but in some years the net returns may compare favourably with those obtained in the more productive areas where the costs of farming are much higher due to the more intensive cultivation practices.

Land to be cropped is either ploughed in the fall following harvest or in the spring. In the Gadsby and Drumheller districts, ploughing is usually done in the spring, the stubble helping to hold the snow moisture during the winter. In the Innisfail district, much of the ploughing is done in the fall, the chief reason for this being the greater proportion of the farm acreage to be ploughed between harvest and the following spring than on the prairies where more land is in fallow.

Use of the plough.—The moldboard plough is the most commonly-used implement in the Innisfail district and in much of the Gadsby district. In both districts the one-way disk is increasing in importance, but it is of more general use in the Drumheller district. It is most useful in preparing stubble land for crop where it is desired to leave stubble and trash on top to protect against soil drifting. The one-way disk is used with success in the Innisfail district where the more costly operation of ploughing can be avoided. It is used in place of other surface cultivation implements where a more rugged treatment of weeds such as couch grass, Canada thistle and perennial sow thistle is required.

Weeds a menace.—There are other bad weeds in the Innisfail district besides the three mentioned. Two of these are wild oats and stinkweed. Both of these weeds are found in the Gadsby and Drumheller districts as well. Couch grass and Canada thistle are also found in the Gadsby district, but under the drier conditions they are more easily controlled. Weeds, of course, are a menace to the farmer for they cut down on the yield and add to the costs of farming. He must expect to have them, however, and his cultivation practices must be planned to effectively control them.

The operator must not only think about weeds and weather in planning his cultivation practices, but also insect pests and fungus diseases. The possibility of these may necessitate an additional cultivation practice, or a somewhat different one than would be carried out to ensure against other hazards.

Hail damage.—There is still another crop hazard which commonly occurs in this same region. More than two-fifths of the farmers in the Drumheller district had crop losses from hail during the year, 1943. On about one-fourth of these, less than 5 bushels per acre was threshed. There is little a farmer can do about this hazard. If his area is subject to hail storms, he must plan for a periodic loss and consider this as an additional cost in his farming operations. He can cover part of the risk by hail insurance. More than one-third of the farmers in the Drumheller district carried hail insurance in 1943. The claims paid averaged over $400 per insured farm. Premiums paid averaged about $100. In the Gadsby and Innisfail districts, fewer crops were damaged by hail during 1943. Nevertheless, a storm passed through these districts, and on 8 per cent of the farms severe damage was done to the grain crops. Fewer farmers in these two districts carried hail insurance than in Drumheller.

Damage by hail is usually heavier to a grain crop than to forage crops. The rain which usually accompanies the hail storm often brings forth a heavier forage crop than would otherwise have occurred, whereas the grain crop is partially or wholly destroyed.

Forage crops grown.—As noted, there is an increasing acreage devoted to grasses and legumes in the Gadsby and Innisfail districts. Brome is the most common grass in the Gadsby district although crested wheat grass is growing in popularity. Sweet clover does well in the same area but it is not common. The other kinds of clovers and alfalfa do well in the Innisfail district and are grown either alone or in mixtures with brome and timothy.

The growing of grasses and legumes, as noted, is the most satisfactory way of controlling weeds provided they are grown to produce hay and only a limited amount of grazing is done. In grazing, the fodder plants must compete not only with the weeds but with the animals as well for usually the worst weeds are less palatable to the stock than are the cultivated fodder plants. There is another reason for growing grasses and legumes as well as to clean a crop, and that is to maintain soil fertility and to add fibre to the soil. Generally, the soils of the parkland and prairie regions are quite fertile, but putting the land into grasses for a while improves the physical condition of the soil and makes it less susceptible to drifting. On the grey wooded soils of the woodland regions, it has been demonstrated that the fertility is not only maintained but increased by growing legumes.

Hazards in Animal Production Also

Feed.—There are also hazards in animal production. Animal production is dependent on crop production. When crops fail, livestock numbers have to be reduced drastically unless feed reserves are available. In this respect, the hog enterprise is in a more vulnerable position than are the cattle enterprises. In the Innisfail district, there were fewer sows in the spring of 1944 than one year earlier. The 1943 grain crop was barely two-thirds of normal. During the same time in all three districts, cattle numbers increased. Yields of hay were generally good and so were the pastures in all three districts. Usually, too, there is a greater range of feed and fodder available for cattle than for hogs. Even the straw of the poorly-filled grain crops will serve to carry along the cattle. However, there have been years, in the territory of which Gadsby is a part, when with the grass dried up and the feed exhausted due to extreme drought, many cattle herds had to be disposed of.

Other physical hazards in animal production.—There are hazards other than the uncertainty of regular feed supplies. There are disappointments in the number of young animals born and losses through deaths caused by diseases. An unthrifty condition in the animals may develop resulting in slow gains and thus wiping out any planned-for profits in the animals produced for sale. This latter situation obtained on a few farms in the area covered by the survey, particularly on those farms of the grain type. As already noted, the restriction on grain marketing from 1942 to 1944 encouraged a number of farmers to raise and feed hogs who had had little experience in this enterprise. Not only did a number of these farmers lack experience with hogs, but their farms were ill-equipped in regard to housing and feeding facilities to handle the larger number of hogs. However, in the care and management of swine—and this applies to other livestock enterprises as well—the housing and equipment does not have to be expensive, but it must be adequate and satisfactory from the standpoint of sanitation and convenience in handling the stock; and careful attention to detail in feeding must be given.

Economic Hazards in Farming

There are economic as well as physical hazards, and these affect both crop and animal production. These economic hazards are due to price changes.

Prices of farm products change.—Prices of most commodities are subject to change. Those of agricultural products are subject to wide changes, chiefly because of the greater variation in supplies offered for sale as compared with demand. Over these wide fluctuations the individual farmer can exercise little control. He cannot make any rapid adjustment of his own supply, and even if he could, it would not affect the total supply to any extent.

Nevertheless, changes in farm product prices do affect the farmer's operation and his profit.

Grain and hog prices.—During the early part of the year of the study in the Gadsby-Drumheller-Innisfail area, there was a surplus of grain—it was relatively cheap. There was a big war demand for pork. It was profitable to feed hogs and had been so for some time. In the six months preceding the beginning of the business year of the study, grain (No. 3 Northern wheat) brought in 65 cents per bushel in the area, and hogs $15 per cwt. live weight. During the first six months covered by the business year of the study, grain sold for 75 cents and hogs brought in $15. At the end of the business year, grain sold at $1 and hogs brought in $15.50 per cwt., only 50 cents more per cwt. than they brought in eighteen months before. That is, over the period under review, grain prices advanced 50 per cent, whereas hog prices advanced less than 5 per cent.

Although, as noted, there was a decline in the numbers of sows on farms in the Innisfail district (which was due, in part, to lower crop yields), there was also nearly a 30 per cent decline in the numbers of sows kept on the Drumheller and Gadsby farms, where average and above average grain yields were harvested and stocks of grain carried over on farms from previous years were still high. One of the apparent reasons for the decreased hog production must have been the greater increase in prices of grain compared with those of hogs. The greater increase in the price of grains compared with the increase in the price of hogs worked to the disadvantage of the hog producer.

Physical factors, prices, and farm program.—Two reasons were advanced for the decrease in hog production in the Innisfail district; namely, short crops, and the relatively greater increase in grain prices compared with hogs during the period under review. The latter was one of the reasons for the decrease in hog production in Gadsby and Drumheller, but there was still another reason, particularly in the Drumheller district. With the heavy-textured soil, favourable

topography, and climate suited for wheat production, farmers in this district have a comparative advantage for wheat production compared with many other districts of Alberta, and they were able to exploit this advantage again as soon as their regular channels for marketing their wheat were restored. Cattle numbers—particularly beef—increased during the same period. The change in yield and price of grain does not have as direct an influence on cattle production as on that of hogs. Grain plays a less important part in the feeding program, fodder and pasture being the bulk feeds for cattle and there is no alternative market for these. Cattle also require comparatively less labour.

Price changes and farm program.—The question is, how much should a farmer be influenced by changes in prices in deciding what to produce? This will depend upon whether the price change is a temporary or a permanent one. Under certain conditions, a permanent change in prices may call for drastic alteration in the production program. With any temporary price changes, in the long run, there is likely to be little gained in making drastic alterations in an established farm program. If the farm is favourably situated with respect to natural conditions and market, for the particular enterprise or enterprises which are carried thereon, the farmer would do well to continue as he is with only such adjustments as are necessary to bring about more efficient use of labour and capital.

CONCLUDING OBSERVATIONS

Continuous Farm Records

Throughout this report frequent reference has been made to the importance of farm type in planning the business for continuous profits. For the year of the study (1943-44), the mixed type farms in the Gadsby district, the grain type in the Drumheller district and the livestock type in the Innisfail district showed the highest net returns (measured by net farm income and surplus). That year the Gadsby crop was much above its long-time average, the Drumheller crop about average, and the Innisfail crop much below the average of the district. For part of that year, too, prices for livestock and livestock products were relatively high compared with grains in terms of their long-time price relationships. If continuous records covering a period of years had been available for study, no doubt it would have been indicated that the highest returns were associated with the predominant type of agriculture of the district, for essentially that is what creates farm type. One seeks to raise those products from which one can obtain the highest net returns. However, these records would have revealed higher average net returns for the Innisfail farms than for the Gadsby farms, exactly the opposite to what occurred in 1943-44 (see Table 13).

Continuous records provide averages of costs and returns in which the effects of variations from year to year, caused mainly by weather and prices, are ironed out. The nearest approach to the results of continuous records, from the 1943-44 study, is to assume the same organization for the farms as existed during the year of the survey and estimate the receipts according to the long-time yield and prices of the district, making such adjustments to costs for the added or deducted quantity produced for sale, and for the increased or decreased costs of goods and services.

Long-time Estimates of Net Returns

Estimates of probable net farm incomes and the surpluses of the farms in the Gadsby-Drumheller-Innisfail area, using the average grain yields of their respective districts and average prices and costs of the ten-year period 1935-44, are given in Table 18a.

The assumption is made that the farms over the long-time period are organized the same as in 1943-44 and that the same number of animals and quantities of livestock products were sold as in that year. The grain sales would differ from the 1943-44 sales as to whether average long-time yields were above or below those of that year. Prices of products sold and costs of goods and services as well as family living costs were adjusted according to the ratio of the ten-year (1935-44) average of these to the prices and costs of 1943-44.

In the table on estimated returns, the grain farms of the Innisfail district and the livestock and mixed farms of Drumheller have been excluded from the groups since these are exceptions to the usual types of the districts. The farms, too, have been grouped according to size in quarter sections and the net returns given by farm size groups.

It will be noted that based on more normal yields and prices one could expect as large a surplus from a half-section farm in the Innisfail district as a full section in the Gadsby district.

While there were striking differences between the estimated average net returns of Gadsby and Innisfail farms in comparable size groups, there was less difference between the estimated returns of all of the Gadsby farms and

TABLE 18a.—ESTIMATED NET FARM RETURNS BY DISTRICTS AND FARM SIZE WITH 1921-44 CROP YIELDS AND 1935-44 PRICES—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Size in Quarter Sections	District		
	Gadsby	Innisfail	Drumheller
	Net Farm Income		
	$	$	$
1	497	803	.....
2	779	1,305	1,540
3	1,083	2,225	2,379
4	1,411	2,666	3,583
5 and over	1,888	4,492	4,980
All sizes	1,136	1,586	3,128
	Surplus Above Living Costs		
1	— 71	124	.....
2	42	454	744
3	228	1,175	1,541
4	484	1,411	2,483
5 and over	785	2,984	3,686
All sizes	291	691	2,147

all of the Innisfail farms. There were more large-sized farms and fewer small ones in the Gadsby district relative to the same size groups in the Innisfail district. The predominant wheat and cattle enterprises of the Gadsby district were associated with a moderately extensive type of agriculture, and the predominant coarse grain, hog and dairying enterprises of the Innisfail district were associated with a less extensive one. While on the whole the Gadsby farms were larger than the Innisfail farms, the adjustment in size and kind of organization had not gone far enough to offset the advantages derived by the more fertile soil and more favourable climate for crop production which conditioned the less extensive type of agriculture carried on in the Innisfail district.

Organization for High Returns

The estimates of net returns given in Table 18a offer a cogent explanation of the differences noted in an earlier section of this report in the prosperity of the three districts. These differences were indicated in the general appearance of the farms, the size and condition of the buildings and the net worth of the operators of the farms. The estimated net returns of the Drumheller farms are particularly revealing. Some of the most productive grain land of Western

TABLE 18b.—NUMBER OF FARMS OF PREDOMINANT TYPE FOR DISTRICT BY SIZE—GADSBY-DRUMHELLER-INNISFAIL, 1943-44

Size in quarter sections	Number of Farms		
	Gadsby	Innisfail	Drumheller
1	12	32	4
2	28	38	17
3	19	14	13
4	16	6	10
5 and over	19	7	24
All sizes	94	97	68

Canada lies in the Drumheller district and is being utilized for that purpose, chiefly in the production of wheat. As noted, the other two districts comprise land of somewhat different characteristics, and there are other factors which make other enterprises more desirable. Upon the choice of these and their organization into the farm program and the making of timely adjustments necessitated by production and marketing hazards will depend the successful operation of the farm business.